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National Detector Dog Manual

Appendix C

History of Detector Dog Programs

Contents

Introduction

When presenting media and public awareness events, detector dog handlers may find it useful to have interesting and accurate facts at their disposal about working dogs, the use of detector dogs, the breeds or types of dog they are handling, the scope of detector dog deployment, and some facts about scenting ability in dogs. The following sections provide plenty of information gleaned from reliable sources that can be used in a variety of public presentation formats.

History of Working Dogs

Dogs have a long history of working in partnership with human beings. Much of that history is bound up in warfare. The use of war dogs dates to centuries Before the Common Era (B.C.E.) as dogs had roles as warriors, guards and protectors in service to the Egyptians, Greeks, Assyrians, Persians and the Roman Empire. Roman legions deployed entire formations of armored attack dogs against enemy armies. Attila the Hun used mastiff-type dogs and Talbot hounds (ancestors of bloodhounds and beagles) as warriors in his campaigns and as sentries when his troops were encamped.

Dogs were used as sentries, guards, mascots, messengers, draft animals and scouts by armies worldwide. Our appreciation of their scenting ability was slow to develop. Perhaps the most famous early scenting dog was Barry, a Saint Bernard. From 1800 until 1812, Barry lived with the monks in a hospice in Saint Bernard Pass at an altitude of over 8000 feet. With his legendary little keg of brandy around his neck, Barry used his wonderful sense of smell to rescue over 40 persons during his career.

In the United States, during the French and Indian Wars in 1775, Benjamin Franklin recommended the use of dogs by the U.S. Army as a means of searching for marauders who were killing colonists and burning settlements near Boston, and in 1779, William McClay of Pennsylvania's Supreme Executive Council recommended using dogs to search for scalping parties. In 1835, the U.S. Army imported bloodhounds from Cuba with their handlers to use as man trackers in the swamps of western Florida and Louisana.

History of Dogs as Scent Detectors

As early as 1888, bloodhounds were employed by Scotland Yard for scent detection work in the “Jack the Ripper” case. Although the dogs did not figure prominently in the case, the British police and military continued to explore the use of dogs in scent work, and continued to train scent dogs, which they used in a limited capacity to detect land mines during World War I (WWI) and munitions caches in World War II (WWII). After WWII, the government of Finland started a land mine detection program based on the successful British program, and experimented with small breeds such as schnauzers and spaniels.

One of the first organized uses of scent detector dog units was by the Nazi army. They used tracker dogs to silently follow tracks of the British Special Air Services (SAS) officers who parachuted into Germany to collect intelligence prior to WWII. These dogs were trained to follow a given ground scent. The dogs sniffed a footprint, an article of clothing or a blood trail, and discriminated the specified trail among hundreds of other odors that had crossed it. German tracker dogs served dual duty; they located and attacked their quarry.

The British Army adopted the idea of using silent tracker dogs for location purposes only, and incorporated this training into their war dog program. In 1943, the British Army established “Recce Patrols,” using human scouts and tracker dogs to locate the Japanese who were hiding on islands in the Pacific theatre.

Although the Metropolitan Police Department’s Scotland Yard had trained dogs as substance scent detectors as early as the mid-1950’s, the use of dogs for the detection of illegal substances, such as narcotics and explosives, began in earnest the 1960’s. In 1968, the U.S. Department of Defense established a Military Working Dog Program at Lackland Air Force Base in San Antonio Texas and in 1971, began training detector dogs for drug interception duties on ships and aircraft returning from South Vietnam.

In late 1969, the U.S. Customs Service carried out a feasibility study on using dogs to detect narcotics and dangerous drugs. At Lackland Air Force Base, on April 1, 1970, U.S. Customs began an experimental narcotic detector dog training program, concentrating its efforts on training dogs to detect and respond to marijuana and hashish. Later that year, they expanded the targeted drugs to include cocaine and heroin. At the time, the success of training a drug detection dog on four odors was considered unlikely, and the Customs dogs gave the first example of the versatility of dogs in learning to discriminate several target odors.

At approximately the same time, the British Royal Army Veterinary Corps began training its own army dogs to detect drugs. They soon followed the drug detection program with explosives detection work to assist in quelling the strife in Northern Ireland. The U.S. followed suit and began training and deploying explosives detector dogs in 1973. By the mid-1970's government agencies throughout the world were using detector dogs for various specialized tasks.

In 1976, the U.S. Air Force started testing smaller breeds for detector tasks, including beagles and cocker spaniels. These small breeds had the advantage of easily searching close spaces that were inaccessible to the German shepherd dogs that had been used traditionally.

History of Agricultural Detection by Dogs

The Mexican government was the first to use dogs to detect agricultural quarantine items. In the late 1970's the United States Department of Agriculture (USDA) developed a similar program using dogs to search international mail and incoming passengers' baggage at international airports. The USDA began its training of agricultural detector dogs at Lackland Air Force Base. Until 1983, USDA used large breed dogs, such as Labrador retrievers and Australian heelers, and searches were conducted in non-public areas only.

The success of the large breeds created interest in a more visible canine detection program and USDA began to consider using small breeds to work in the presence of the public and in close proximity to international passengers. Beagles were selected by the USDA for the task as they are historically excellent scent hounds, and because the U.S. Navy had successfully deployed them as narcotic detector dogs. Also, due to their small, non-threatening size and appealing demeanor, they are extremely popular with the traveling public and the media. They are working advertisements for the mission of the USDA and the importance of agricultural quarantine work. Using beagles trained to indicate in a passive manner has had far-reaching effects on detection work world-wide.

In 1984, the USDA launched a novel pilot program with one beagle team at Los Angeles Airport. This was the beginning of the program we know as our "Beagle Brigade." At the time, the program was a major departure from any existing substance detection programs. The beagles were trained as they still are, to work close to the public at baggage carousels in international airports, and to respond passively, or to sit, when indicating the presence of agricultural quarantine material. Their reward is food for each correct response, which increases the intensity of their focus on task and the duration of their search time.

Beagles have long been the "workhorse" of the USDA program. Today the beagle has become known internationally as The Agricultural Detector Dog. Detector dog programs using beagles have been adopted in the U.S., Canada, Taiwan, Australia and New Zealand.

In 1997, the USDA responded to the threat of pests being introduced into the U.S. through land border crossings by deploying its first "Border Brigade" dogs. Beagles were used in a pilot project launched at Hidalgo, Texas. Beagle teams were placed at El Paso, Laredo and Hidalgo, Texas. Although the beagles were successful, by 2000, the agency returned to its use of large breeds due to the strenuous nature of performing vehicle searches. Currently there are "border dog" teams at both northern and southern borders with plans to expand the program.

In 2001, the USDA deployed its first cargo dogs in Texas, Washington State and California, again using larger breed dogs that are best suited to the stresses of searching containerized and palletized materials in warehouses and holding areas. These dogs are trained to use an active response to indicate the presence of specific agricultural materials in commercial shipments. We continue to evaluate the size and use of detector dogs in cargo situations.

In addition to the quarantine material detectors, the APHIS Wildlife Services (WS) has a detector dog program using terriers that are trained to sniff for brown tree snakes in aircraft, vehicles, household goods, and ships leaving Guam for snake-free areas like Hawaii, the Mariana Islands, and Saipan. Brown tree snakes have infested the island of Guam, causing the extinction of several native species of birds. To protect the rare flora and fauna in Hawaii, it is important to avoid accidentally introducing this destructive pest into the environment.

Scent Basics

Dogs are wonderful odor detection devices because of their abilities to discriminate specific scents among complexes of many, overlapping scents. But there are other reasons why they make such good detectors of contraband materials. One way dogs are superior to gas-sensing machines as detection devices is that they can selectively locate odors. First, dogs sample air in an extremely efficient manner. Second, they are mobile, and can take their handlers directly to an odor source. As they move about, they can pick up the "thread" of an odor that interests them. By casting back and forth with their bodies and their heads, and by constantly taking tiny samples (sniffs), they compare odor concentrations and "calculate" the direction of increasing concentrations, following the molecular concentration gradient to its strongest point, or source. Fine-grained pinpointing of odor is achieved when the dog compares the strength of scent received in each of its mobile nostrils.

Dogs are extraordinary among mammals for their abilities in both reception and discrimination of odorants. Dogs can recognize the scent of table salt in 1:10,000,000 dilutions![1] Nearly 1/8th of the canine brain and more than half of the canine internal nose is committed to olfaction.[2] While human beings have a nasal epithelial area of 3-5 cm^2, dogs, in general, have an epithelial area ranging from 18-150 cm^2, and beagles, specifically, have an epithelium of about 75 cm^2. Beagles are just about average among dog breeds as far as being endowed with scenting equipment.[3] Another comparison, which unfortunately does not specifically list beagles, is that human beings have 5 million sensory cells; German shepherd dogs have 220 million sensory cells; dachshunds have 125 million; and fox terriers have 147 million. The number of sensory cells apparently correlates to some extent with the size of the dog. The larger area and proliferation of receptor cells most certainly enhances discriminatory ability.

1 Kaldenbach, Jan. 1998. K9 Scent detection. Detselig Enterprises, Alberta.
2 Syrotuck, W. G. 2000. Scent and the scenting dog. Barkleigh Productions, Inc., Mechanicsburg.
3 Albone, E. S. 1984. Mammalian semiochemistry investigation of chemical signals between mammals. Chichester, West Sussez: John Wiley and Sons Ltd.
Dodd, G. H. and D. J. Squirrel. 1980. Structure and mechanism in the mammalian olfactory system. Symposia of the Zoological Society of London, 45:35-36.

The most remarkable aspect of the canine sense of smell is their ability to discriminate between complex mixtures of odors. Although dogs can detect odorants in quantities far lower than we can, it is the accuracy with which they can discriminate among odors that is the primary quality making them invaluable for odor detection. To illustrate this concept, also called "odor layering," consider this scenario: If you go into a kitchen where someone is cooking chili, you can smell chili. If a dog goes into the kitchen, it can smell the hamburger, the beans, the tomatoes, the garlic, each of the seasonings, and so on. The dog can separate each element of the chili into an individual layer or component of odorant.

Basically, if an odor is there, the dog can smell it. This is why odors cannot be effectively masked from detection by the canine nose simply by attempting to disguise them with stronger odors. Because dogs can detect minute quantities of odorants, and because they are considerably more capable of discriminating between the individual molecular combinations that identify odorants, attempts to "fool" detector dogs by packaging prohibited fruit or meat with other strong-smelling items are usually unsuccessful.

A Variety of Scent Duties

Today, detector dogs have many functions—they assist local, state and federal agencies in locating evidence, intercepting contraband and smuggled items, help police officers find criminals, lost children and the bodies of victims, are members of search-and-rescue teams, seek out land mines, search for live victims of earthquakes and other disasters, find evidence in arson investigations, detect explosive devices, poached abalone, and can even detect malignant skin growths. These jobs are mundane, though, when compared to some of the specialized uses of their scenting ability. The USDA has used dogs to detect screwworm infestations in cattle and the presence of brown tree snakes in aircraft. Australian shepherds have been used to indicate when cows are fertile so that farmers can breed them at the right time during their short estrus. Beagles are increasingly used to precisely locate termites in buildings to avoid the necessity of treating the entire structure. U.S. Customs has further expanded its war on drugs using dogs to indicate substantial amounts of currency that may be associated with a drug transaction. Dogs have been used to perform ecological studies of wildlife by indicating on the scats of specific animals, demonstrating that certain species are present in an area under study. Even with work on an "artificial nose" for detection of substances continuing, dogs are being used with increasing frequency to detect a variety of substances.

Breed Selection Information

All dogs bring superior scenting abilities to the table. Limitations on the endurance required to perform scent work, however, eliminates the extremely short-nosed breeds (e.g., pugs, Boston terriers, Pekingese, etc.) as working scent detection dogs. The German shepherd dog was traditionally the breed of choice due to its long history of development for working ability. However, it, and other excellent large working breeds, such as Rottweilers, Belgian malinois, and Bouvier des Flandres have also been bred for protective devotion to their handlers which can create focus difficulties for a dog team deployed in highly public areas. Because the USDA is a regulatory agency that stresses voluntary compliance, breeds that are less likely to be associated with protective, military and law enforcement functions enhance the image of the agency.

Beagles

As members of the hound group, beagles have been bred as pack hunters of small game for centuries. They were first recognized by the American Kennel Club (AKC) in 1885. The pack orientation of beagles makes them very sociable. They are extremely curious, gentle, and are among the least aggressive of all dog breeds. They have excellent memories and are very active. Their focus on interesting scent and love of food is legendary, all of which qualities make them ideal as highly visible USDA detector dogs in close contact with the public.

The National Detector Dog Training Center

After the early training at Lackland Air Force Base, from 1986 to 1987, APHIS opened 3 regional training centers, in New York, Miami and San Francisco, and in 1988, began training its own teams. The major contributors to the fledgling program were Douglas R. Ladner, PPQ Senior Staff Officer, and PPQ Officers Mike Simon, Mel Robles, Cal Brannaka, and Hal Fingerman. In October, 1997, the National Detector Dog Training Center (NDDTC) was opened in Orlando, FL, unifying the 3 regions. The NDDTC is located on almost 2 acres of land, the buildings occupying 7,800 square feet. The facility includes 30 kennels, 5 quarantine runs, mail and passenger training areas, and classrooms. An alternate site was opened in 2000 for use by trainers for preparing the dogs for classes. All PPQ Canine Officers and detector dogs complete basic training at the NDDTC. Additionally, more advanced training and training for other countries is performed at the training center. NDDTC trainers have provided expertise and training to agriculture officials in other countries starting up their own detector dog programs (e.g., Taiwan, Canada, Australia, New Zealand, Guatemala, Mexico, and South Korea). NDDTC trainers contribute a tremendous diversity of experience and training techniques to the success of the program.

The mission of USDA's National Detector Dog Training Center is to "provide a positive learning environment to train detector dogs and officers as teams to safeguard American agriculture" and to "develop innovative ways for these teams to prevent pests and agricultural diseases from entering the United States through airports, international borders, mail facilities and cargo areas."